Attachment H

Proposal # 2001- K-212 (Office Use Only)

habitat simulation model to assess benefits of channel restoration.

PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: Evaluate use of a two-dimensional hydraulic and

Applicant Name: U.S. Fish and Wildlife Service

Contact Name: Mark Gard

Mailing Address: 2800 Cottage Way, Room W-2605, Sacramento 95825

Telephone: 916-414-6588

Fax: 916-414-6710

Email: Mark_Gard@fws.gov

Amount of funding requested: $ 11,000

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost _____ Federal cost _____

Cost share partners? ___ **Yes** X **No**

Identify partners and amount contributed by each _____

Indicate the Topic for which you are applying (check only one box).

- ☐ Natural Flow Regimes
- ☐ Nonnative Invasive Species
- ☐ Channel Dynamics/Sediment Transport
- ☐ Flood Management
- ☐ Shallow Water Tidal/ Marsh Habitat
- ☐ Contaminants
- ☐ Beyond the Riparian Corridor
- ☐ Local Watershed Stewardship
- ☐ Environmental Education
- ☐ Special Status Species Surveys and Studies
- ☒ Fishery Monitoring, Assessment and Research
- ☐ Fish Screens

What county or counties is the project located in? Merced

What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible 13.3

Indicate the type of applicant (check only one box):

- ☐ State agency
- ☐ Public/Non-profit joint venture
- ☐ Local government/district
- ☐ University
- ☐ Other: _____
- ☒ Federal agency
- ☐ Non-profit
- ☐ Tribes
- ☐ Private party

Indicate the primary species which the proposal addresses (check all that apply):

- ☒ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☐ Winter-run chinook salmon
- ☐ Spring-run chinook salmon
- ☐ Late-fall run chinook salmon
- ☐ Fall-run chinook salmon
- ☐ Delta smelt
- ☐ Longfin smelt
- ☐ Splittail
- ☐ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ White Sturgeon
- ☐ All chinook species
- ☐ Waterfowl and Shorebirds
- ☐ All anadromous salmonids
- ☐ Migratory birds
- ☐ American shad
- ☐ Other listed T/E species: _____

Indicate the type of project (check only one box):

- ☒ Research/Monitoring
- ☐ Watershed Planning
- ☐ Pilot/Demo Project
- ☐ Education
- ☐ Full-scale Implementation

Is this a next-phase of an ongoing project? Yes X No___
Have you received funding from CALFED before? Yes ___ No X

If yes, list project title and CALFED number_____

Have you received funding from CVPIA before? Yes X No___

If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):

AFRP, Evaluate use of a two-dimensional hydraulic and habitat simulation model (River 2D) to assess benefit of channel restoration.

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Mark Gard
Printed name of applicant

Mark Gard
Signature of applicant

Executive Summary

Project Title: Evaluate use of a two-dimensional hydraulic and habitat simulation model (River2D) to assess benefits of channel restoration

Proposed AFRP Contribution: $11,000

Applicant: U.S. Fish and Wildlife Service, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825. Phone: (916) 414-6588, Fax: (916) 414-6710, E-mail: mark_gard@fws.gov.
Participants and collaborators: California Department of Fish and Game, California Department of Water Resources, Robinson Cattle Company.

The proposed project is to quantify features of fall-run chinook salmon spawning and rearing habitat, before and after restoration, in the Robinson restoration project, located at RM 42-43.5 on the Merced River. This is a monitoring type of project. The primary fishery objective of the project is to evaluate whether the Robinson restoration project on the Merced River increases spawning habitat (and thus potentially increases spawning success) and rearing habitat (and thus potentially increases juvenile survival) as measured and quantified by the method described in this proposal. The tasks comprising this project are: 1) project management; 2) field reconnaissance and site selection; 3) hydraulic data collection; 4) construction and calibration of hydraulic and habitat simulation models; and 5) biological validation of the habitat simulation model. The latter four tasks will be conducted both before and after restoration of the Robinson project. Analytical procedures will involve the application of a two-dimensional hydraulic and habitat simulation model (River2D, Steffler 1999). The deliverable for this project will be a final report comparing the amount of spawning and rearing habitat present, over the range of flows of 100 to 2500 cfs, before and after restoration. Pre-restoration activities will be conducted in FY-2000-2001, while post-restoration activities will be conducted in FY-2002 or 2003, depending on the schedule for restoration, and after the first and second channel-forming flow events (greater than 5000 cfs).

The main hypothesis to be tested by this project is that restoration activities will increase the amount of spawning and rearing habitat for chinook salmon in the Merced River. Uncertainties being investigated are what effect restoration projects have on habitat for fall-run chinook salmon and how well the proposed method works to quantify physical habitat for this species. The expected outcome of this project is a final report comparing the amount of rearing and spawning habitat present in the Robinson restoration area before and after restoration actions over a range of discharges, and giving results of biological validation. This project will apply to the CALFED ERP goal of achieving recovery of at-risk species by evaluating the extent to which restoration projects increase habitat for fall-run chinook salmon. This will be the second year of funding for this project. The proposal for the first year of funding underwent a peer review with comments from the peer review incorporated into the project. There may be a follow-up subgroup of peer reviewers established to assist in some technical aspects of this project. This project is a component of a larger project (the Robinson restoration project) being submitted this year for CALFED funding. The Robinson restoration project is being carried out by the California Department of Fish and Game and the California Department of Water Resources.

C. Project Description

1. Statement of Problem

a. Problem

Millions of dollars are being spent on large-scale channel restoration projects throughout the Central Valley. One emphasis of these activities is to improve spawning and rearing habitat conditions for salmon and steelhead. No one monitoring tool can definitively document the benefits of these efforts. Usually numerous monitoring tools over varied time scales are required to evaluate efficacy of restoration activities. This monitoring activity will help identify and quantify the level of physical habitat improvement for chinook salmon over a range of flow conditions and after a series of channel adjustments. This effort will infer changes in chinook salmon habitat by predicting physical habitat quality based on several resource axes. These include water depth, velocity, adjacent velocity, cover and substrate. We will statistically test the strength of this inference thorough comparing predictions about high quality habitat to that which fish actually use for spawning and rearing. A potential benefit of testing this tool to evaluate habitat changes and fish use is that of economy. Being able to make predictions about quantity and location of "habitat" over a large flow range provides potential large savings in time and money associated with documenting beneficial results of channel restoration activities. Measures used to validate these predictions will help evaluate the potential future utility of the application on a larger scale.

The Physical Habitat Simulation System (PHABSIM) has been used extensively to predict habitat (Weighted Usable Area) (WUA) changes due to changes in discharge (Bovee 1996). PHABSIM is limited to predicting changes in WUA due to changes in discharge. Two dimensional modeling can predict changes in WUA resulting from changes in flow and changes in channel morphology. A preliminary study examined the utility of the River_2D modeling system (Steffler and Sandlin 1998) for evaluating changes in WUA due to channel rehabilitation in the Trinity River. Chinook salmon location and density were significantly correlated with habitat suitability predictions at both sites. Predicted chinook and coho salmon and steelhead fry WUA was higher at the rehabilitation site. Juvenile chinook and coho salmon WUA was increased by rehabilitation at higher flows. It was concluded that two dimensional modeling appears to be a useful tool for evaluating habitat changes in the Trinity River (Gallagher 1999). In 1999, the Sacramento FWO Instream Flow Group completed the first phase of a two dimensional modeling study to evaluate the extent to which a habitat restoration project on Clear Creek below Saeltzer Dam is successful at increasing the quality and quantity of fall-run chinook salmon spawning and rearing habitat (Sauls 1999). The final phase of the study will be conducted following completion of the restoration activities in the summer of 2001.

Project objectives:

1. Evaluate the extent to which the Robinson restoration project reverses the declines in fall-run chinook spawning and rearing habitat in the Merced River.

2. Evaluate whether restoration projects alter the flow needs for chinook salmon in the Merced River.

b. Conceptual Model

Channel restoration results in changes in depths, velocities, adjacent velocities, substrate and cover. These changes, in turn, alter the amount of habitat area for adult spawning and juvenile rearing for anadromous salmonids. Changes in the amount of habitat for adult spawning could affect reproductive success through alterations in the amount of redd superposition. Similarly, changes in the amount of habitat area for juvenile rearing could affect survival or growth of juvenile salmonids. These alterations in reproductive success and/or survival or growth of juvenile salmonids could ultimately result in changes in salmonid populations. The uncertainties which are relevant to this study are: 1) what changes in the amount of habitat area are caused by the channel restoration; and 2) how well the proposed method works to quantify physical habitat given the changes in depths, velocities depths, velocities, adjacent velocities, substrate and cover caused by the restoration project.

c. Hypothesis Tested

The main hypothesis to be tested by this project is that restoration activities will increase the amount of spawning and rearing habitat for chinook salmon in the Merced River. Data needed to test this hypothesis are bed topography, water surface elevations, water velocities and discharges, substrate distributions, cover distributions, and location of redds and juveniles prior to and after the restoration project is completed. A sub-hypothesis to be tested is that that the compound suitability predicted by the River2D model is higher at locations where redds and juveniles are present versus locations where redds and juveniles are absent. Data needed to test this hypothesis are the location of redds and juveniles and output of the River2D model.

This study will provide information that addresses the CALFED identified scientific uncertainty of channel dynamics and the CALFED topic of fishery monitoring, assessment and research. This proposal will address the uncertainty in ecological benefits of the Robinson channel-floodplain reconstruction project. The two dimensional modeling study on the Trinity River provided results measuring the extent to which the restoration activities increases chinook and coho salmon spawning and rearing habitat (Gallagher 1999). Application of two dimensional modeling is thus expected to provide similar measurable results for evaluating the success of the Robinson restoration project while also further assessing the applicability of this methodology as a monitoring and assessment tool. This study will also address the uncertainty in the prediction of habitat by the River2D model.

d. Adaptive Management

In section 3.1 of the CALFED study proposal guidelines, it is stated that "the key to successful ecosystem restoration is learning from all restoration and management actions". The goal of the Robinson restoration project on the Merced River is to make changes in the habitat that will result in increases in the amount of available spawning and rearing habitat for fall-run chinook

salmon that will ultimately increase the population. This goal is based on the previously described conceptual model that channel restoration results in changes in the amount of habitat area for adult spawning and juvenile rearing for anadromous salmonids that ultimately results in changes in salmonid populations.

While the Robinson restoration project will cause changes in the fall-run chinook spawning and rearing habitat, the question remains as to whether the changes in habitat achieve the project's objective of increasing the amount of spawning and rearing habitat or have a negative or neutral effect. The use of the two-dimensional model will be in addition to more standard fish monitoring metrics such as indices of salmon production and survival from and through the project site, both before and after restoration. Geomorphic and floodplain and riparian metrics will also be monitored as part of the project to help assess overall benefits of the restoration. These other monitoring elements are funded by CALFED and will be implemented by both the Department of Fish and Game and Water Resources. The two-dimensional modeling study proposed here will contribute to providing the desired key to measuring the extent of success or failure of the Robinson restoration project and learning from this restoration action. The findings of this study will provide the ability to more precisely quantify the results of the restoration activities and assess what modifications in the restoration activities are needed for future projects. Simultaneously, this study will also help to validate the two-dimensional model as a tool for evaluating habitat restoration projects. Results of the biological validation element of this proposal will be used to change the habitat suitability criteria aspect of the experimental design.

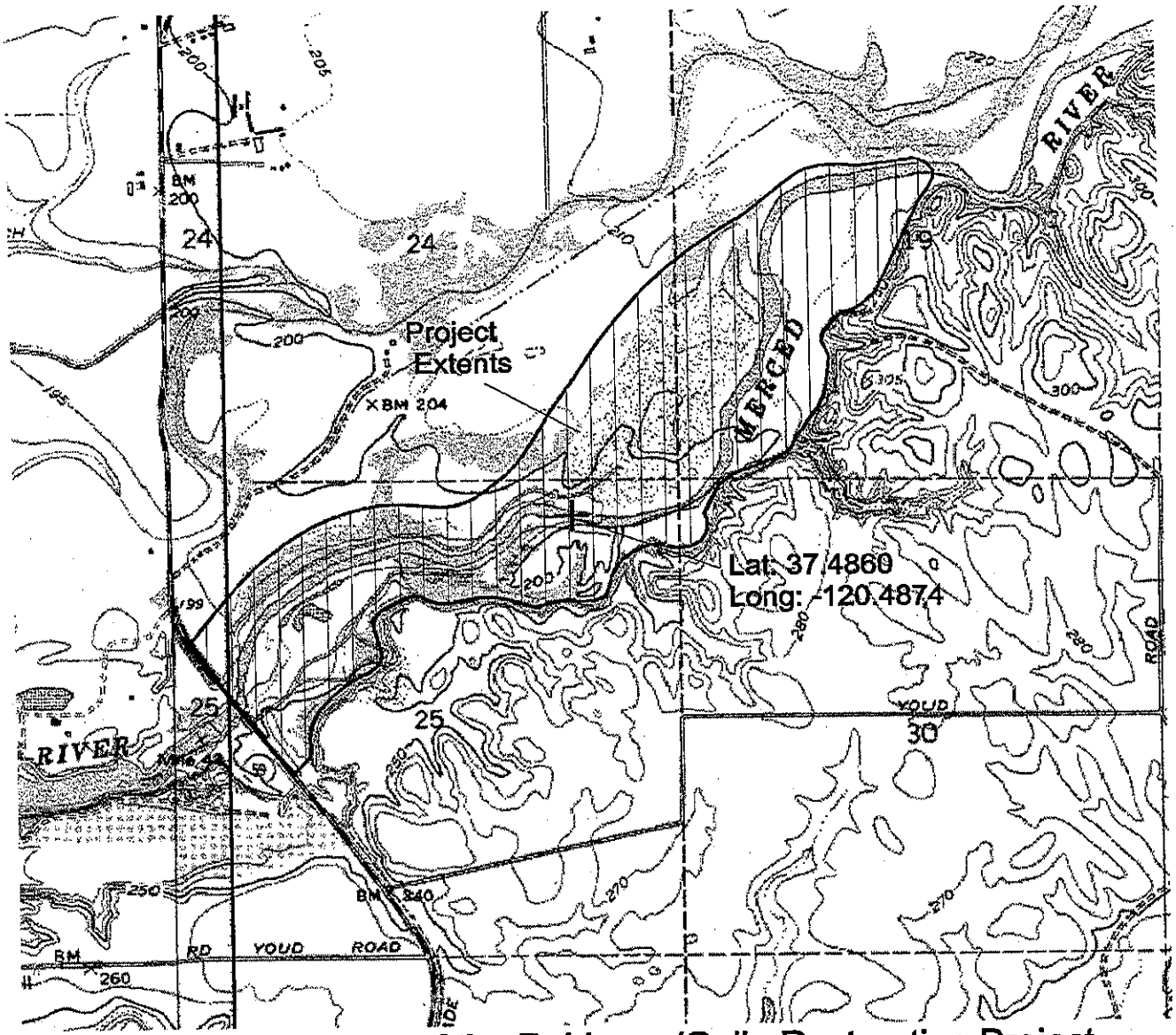
e. Educational Objectives

N/A

2. Proposed Scope of Work

a. Location and/or Geographic Boundaries of the Project

The Robinson restoration project is located in Merced County. The CALFED ecozone that the project is in is 13.1 (East San Joaquin, Merced River). A copy of the USGS quad map showing an outline of the project is attached. The geographic coordinates of the project's center point are Latitude 30.4860 and Longitude -120.4874.



Robinson Phase of the Robinson/Gallo Restoration Project

Base Map Source: USGS 1:24,000 Quads (Yosemite Lake and Winton)

b. Approach

Listed below are the tasks needed to fully complete the Robinson restoration site pre/post habitat monitoring project[1]. The general work to be completed is as follows:

Task 1. Modeling of Spawning and Rearing Habitat in Restoration Site Prior to Restoration

Subtask 1.1 Construction and Calibration of hydraulic and habitat simulation models.

Data collected in FY-2000 will be used in a 2-dimensional hydraulic model (River2D, Steffler 1999) to predict the velocities and depths present in the study sites over the range of flows of 100 to 2500 cfs[2]. The topographic data will first be processed using the R2D_Bed software (Steffler, 1999), where breaklines are added to produce a smooth bed topography. The resulting dataset will then be converted into a computational mesh using the R2D_Mesh software (Steffler 1999), with mesh elements sized to reduce the error in bed elevations resulting from the mesh-generating process to 0.1 feet where possible, given the computational constraints on the number of nodes. The resulting mesh is used in River2_D to simulate depths and velocities at the flows to be simulated.

A PHABSIM transect at the bottom of the site will be calibrated to provide the water surface elevations at the bottom of the site used by River2D. A second PHABSIM transect at the top of the site will be calibrated to provide the water surface elevations used to calibrate the River2D model. The initial bed roughnesses used by River2D will be based on the observed substrate sizes and cover types. A multiplier will be applied to the resulting bed roughnesses, with the value of the multiplier adjusted so that the water surface elevations generated by River2D at the top of the site match the water surface elevations predicted by the PHABSIM transect at the top of the site[3]. The River2D model will be run at the flow at which the validation dataset was collected, with the output used in GIS to determine the difference between simulated and measured velocities, depths, bed elevations, substrate and cover. If significant differences are found, the bed topography will be adjusted to correct the observed errors, and the models will be rerun. The final report will include these differences, how well the model predicts observations before modification of the bed topography, and implications of interpretation based on potential bed topography adjustments.

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[1] The following tasks will be completed in FY-2000 and are thus not included in this proposal: 1) field reconnaissance and study site selection for pre-restoration monitoring; and 2) hydraulic data collection for pre-restoration monitoring. The activities involved in these tasks are the same as those identified below for Subtasks 2.1 and 2.2. In addition, most of Subtask 1.1 will be completed in FY-2000.

[2]Discharges will be modeled under steady-state conditions. The Robinson restoration area does not include any areas with supercritical flow.

[3]This will be the primary technique used to calibrate the River2D model.

The depths and velocities simulated by the River2D model, along with the substrate and cover distribution in the site and Habitat Suitability Criteria previously developed on the Merced River or other streams, will be used to predict the amount of spawning and rearing habitat present over a range of discharges in the Robinson restoration site prior to restoration actions. We have sufficient data to use criteria from the Merced River for spawning, but have no data to develop rearing criteria on the Merced River.

Subtask 1.2 Biological validation of habitat simulation models.

The sites will be snorkeled once with a weighted tag dropped at each location where juvenile chinook salmon are observed. The snorkeler will record the number of juvenile salmon in different size categories and the cover present at the location. After the snorkeling has been completed, bed elevation, horizontal location, depth, and velocity data will be collected at each tag location using the same methods used for the physical validation dataset. The above data will be used to test the hypothesis that the compound suitability predicted by the River2D model is higher at locations where juveniles are present versus locations where juveniles are absent. This hypothesis will be statistically tested with a Mann-Whitney test. This effort will be expanded to sampling at several flows if additional funding is available.

The sites will be waded in early November with the same measurements described above (except that substrate data will collected instead of cover data) taken at each redd location. This data will be used to test the hypothesis that the compound suitability predicted by the River2D model is higher at locations where redds are present versus locations where redds are absent. This hypothesis will be statistically tested with a Mann-Whitney test.

Task 2. Modeling of Spawning and Rearing Habitat in Restoration Site After Restoration

Subtask 2.1 Field Reconnaissance and Study Site Selection

Three to four study sites will be selected in the Robinson restoration area. To the extent possible, these will be the same sites selected in FY-2000. However, rerouting of the channel during restoration activities may make it impossible to do so, if the sites selected in FY-2000 are no longer in the channel. New sites will be made as large as possible, consistent with the density of points needed to represent the variability within each site. The new sites will be selected so that the sites in total include all of the mesohabitat types present in the restoration area.

Subtask 2.2 Hydraulic Data Collection

Data will be collected on water surface elevations, bed topography, cover and substrate distribution for input into a 2-dimensional hydraulic and habitat model. Water surface elevations will be taken at three flows (probably around 200, 400 and 1000 cfs). Bed topography data will be collected using a total station at a low flow by a series of lines

across the channel and extending far enough onto the floodplain to include the entire area which would be inundated at 2500 cfs. Each line will include a point at each change in bed slope, substrate or cover. The lines will be spaced close enough so that bed slope, substrate and cover uniformly change between the lines. The bed elevation and horizontal location of each point will be determined using a total station, and the substrate and cover of each point will be recorded. An independent dataset of 50 random points will be collected for each site, to validate the physical predictions of the model. The bed elevation and horizontal location of each validation point will be determined using a total station, the depth and velocity at each validation point will be measured, and the substrate and cover at each point will be recorded. If possible within the existing budget and the duration of flows, validation points will be collected at three flows. Data will be collected three times: once following completion of the restoration project and once after each of the first two channel-forming flows (greater than 5000 cfs) after the completion of the restoration project.

Subtask 2.3 Construction and Calibration of hydraulic and habitat simulation models.

The data from Subtask 2.2 will be used in a 2-dimensional hydraulic model (River2D, Steffler 1999) to predict the velocities and depths present in the study sites over the range of flows of 100 to 2500 cfs[1]. Model construction and calibration will be the same as described in Task 2.3. This output, along with the substrate and cover distribution in the site and Habitat Suitability Criteria previously developed on the Merced River or other streams, will be used to predict the amount of spawning and rearing habitat present over a range of discharges in the Robinson restoration site after restoration actions are complete. The modeling will be conducted three times: once following completion of the restoration project and once after each of the first two channel-forming flows (greater than 5000 cfs) after the completion of the restoration project.

Subtask 2.4 Biological validation of habitat simulation models.

The sites will be snorkeled once (after completion of the restoration construction) with a weighted tag dropped at each location where juvenile chinook salmon are observed. The snorkeler will record the number of juvenile salmon in different size categories and the cover present at the location. After the snorkeling has been completed, bed elevation, horizontal location, depth, and velocity data will be collected at each tag location using the same methods used for the physical validation dataset. The above data will be used to test the hypothesis that the compound suitability predicted by the River2D model is higher at locations where juveniles are present versus locations where juveniles are absent. This hypothesis will be statistically tested with a Mann-Whitney test. This effort will be expanded to sampling at several flows if additional funding is available.

The sites will be waded (after completion of the restoration construction) in early November with the same measurements described above (except that substrate data will collected instead of cover data) taken at each redd location. This data will be used to test the hypothesis that the compound suitability predicted by the River2D model is higher at

locations where redds are present versus locations where redds are absent. This hypothesis will be statistically tested with a Mann-Whitney test.

Project Management

Overall project management and administration including overseeing project coordination meetings, managing project finances (budgets, contracts, etc.), and preparing project progress reports.

c. Monitoring and Assessment Plans

N/A - this proposal is entirely monitoring.

d. Data Handling and Storage

Water surface and bed elevations, depths, velocities, cover, substrate, juvenile numbers, and total station point number data will be recorded in the field in note books. Data collected using the total station will be stored in total station memory and downloaded onto computers. All the data will be entered or imported into spreadsheets. Data will be processed in the spreadsheets and subsequently exported into the modeling software. The data will be available on request in electronic format.

e. Expected Products/Outcomes

Annual progress reports will be submitted covering work completed, future work, and financial aspects. Subsequent to the completion of the study, a final report will be submitted comparing the amount of rearing and spawning habitat present in the Robinson restoration area before and after restoration actions over a range of discharges, and giving results of biological validation. The results of this study will be presented at a AFS conference and submitted for publication in a peer reviewed scientific journal.

f. Work Schedule

Pre-restoration activities will be conducted in FY-2000-2001, while post-restoration activities will be conducted in FY-2002 or 2003, depending on the schedule for restoration, and after the first and second channel-forming flow events (greater than 5000 cfs). Details of the work schedule and major milestones (completion of each subtask) are shown in the attached budget table. All of the tasks are inseparable. This project has been and will continue to be incrementally funded. The project received $25,000 of funding in FY-2000 and we are requesting $11,000 of funding for FY-2001. An additional $35,820 of funding will be needed for FY-2002. A further $32,794 of funding will be required at a later date after channel-forming flows (greater than 5000 cfs).

g. Feasibility

The described approach is both feasible and appropriate to the proposed work based on our experience doing the same work on Clear Creek (Sauls 1999). Methods have been previously described under Approach (C.2.b.) and literature citations given under Problem (C.1.a.). The proposed schedule includes allowances for weather and other exigencies. Completion of Task 2 is dependent on the completion of the Robinson Restoration project. Completion of the spawning portion of Subtasks 1.2 and 2.4 are contingent upon steady flows from the beginning of fall-run chinook salmon spawning through the date of data collection. The timing of Subtask 2.2 is dependent upon the flow regime of the Merced River.

No permits or agreements are needed to proceed with the tasks described. There are no other constraints that could impact the schedule and implementability of the project. Written permission from the property owner is included in the Robinson restoration project CALFED proposal, of which this proposal is a part.

D. Applicability to CALFED ERP Goals and Implementation Plan and CVPIA Priorities

1. ERP Goals and CVPIA Priorities

This project will apply to the CALFED ERP goal of achieving recovery of at-risk species and the CVPIA priority of restoring anadromous fish populations by evaluating the extent to which restoration projects increase habitat for fall-run chinook salmon. Life stages: adult (spawning), juvenile (rearing). Habitats: stream. Stressors: channel form changes.

2. Relationship to Other Ecosystem Restoration Projects

This project is a component of a larger project (the Robinson restoration project) being submitted this year for CALFED funding. The Robinson restoration project is being carried out by the California Department of Fish and Game and the California Department of Water Resources. This will be the second year of funding for this project.

3. Requests for Next-Phase Funding

This is the first phase of this project, although it is the second year of funding. The first year of funding has just been awarded.

4. Previous Recipients of CALFED or CVPIA funding

Project receiving previous funding (from AFRP): Evaluate use of a two-dimensional hydraulic and habitat simulation model to assess benefits of channel restoration. There was no applicable project number. The first year of funding has just been awarded. As such, there are no accomplishments to date.

5. System-Wide Ecosystem Benefits

The project complements other measures in the Merced River, the Bay/Delta and the Pacific Ocean to aid in the recovery of Merced River fall-run chinook salmon.

E. Qualifications

MARK GARD

EDUCATION
B.S. M.I.T. 1983 (Civil Engineering); M.S. UC Berkeley 1984 (Civil Engineering); Ph.D. UC Davis 1994 (Ecology)
POSITIONS
Environmental Engineer, USEPA 1984-1990
Fish and Wildlife Biologist, USFWS 1994-present
PUBLICATIONS
1. Gard, M. 1998. Technique for adjusting spawning depth habitat utilization curves for availability. Rivers 6(2):94-102. 2. Gallagher, S.P. and M.F. Gard. 1999. Relation between chinook salmon (*Oncorhynchus tshawytscha*) redd densities and PHABSIM predicted habitat in the Merced and Lower American Rivers, CA. Canadian Journal of Fisheries and Aquatic Sciences 56(4):570-577. 3. Gard, M. 1997. Threatened fishes of the world: *Ptychocheilus lucius* Girard, 1856 (Cyprinidae). Environmental Biology of Fishes 49:292.

ED BALLARD

EDUCATION
B.S. Principia College 1984 (Biology and Geology); M.S. Miami University of Ohio 1992 (Zoology)
POSITIONS
Fishery Biologist, USFS/PSW 1993-1994
Fishery Biologist, USFWS/Ventura 1994-1997
Fishery Biologist, USFWS/Sacramento 1997-present

ERIN SAULS

EDUCATION
B.S. Humboldt State University 1993 (Environmental Biology and Zoology)
POSITIONS
Fisheries Technician, CDFG/Stockton 1993
Fisheries Biologist, USFWS/Stockton 1993-1999
Fish and Wildlife Biologist, USFWS/Sacramento 1999-present

F. Cost

1. Budget

The detailed budget for each year is attached. The summary budget is below.

PROJECT PHASE/TASK	DIRECT LABOR HRS.	DIRECT SALARY & BENEFITS	OVERHEAD (19%)	TRAVEL COSTS	TOTAL COSTS
PROJECT MANAGEMENT	96	$3,360	$640		$4,000
PRE-RESTORATION HABITAT MODELING					
FIELD RECONNAISSANCE/STUDY SITE	24†	$600	$114		$714
HYDRAULIC DATA COLLECTION	384†	$9,600	$1,824	$3,695	$15,119
MODELING	320†	$8,000	$1,520		$9,520
BIOLOGICAL VALIDATION	256†	$6,400	$1,220	$1,847	$9,467
					$34,820
POST-RESTORATION HABITAT MODELING					
FIELD RECONNAISSANCE/STUDY SITE	24†	$600	$114		$714
HYDRAULIC DATA COLLECTION	864†	$21,600	$4,100	$8,313	$34,013
MODELING	720†	$18,000	$3,420		$21,420
BIOLOGICAL VALIDATION	256†	$6,400	$1,220	$1,847	$9,467
					$65,614
TOTALS					$104,434

† Includes time of principal investigator

Salaries:
Senior Fish and Wildlife Biologist $59,984/year 5% time commitment
Fish and Wildlife Biologist $42,900/year 5% time commitment
Fisheries Biologist $47,190/year 5% time commitment
90% salary/10% benefits

All travel is to conduct fieldwork for this project

Overhead rate includes rent, phones, furniture and general office staff

Overall project management and administration including overseeing project coordination meetings, managing project finances (budgets, contracts, etc.), and preparing project progress reports.

2. Cost-sharing

There is no cost-sharing for this proposal. However, there is cost-sharing associated with the Robinson Restoration project, of which this proposal is a part.

2001 PSP Budget Table.

Table 1. Annual and total budget.

Year	Task	Direct Labor Hours	Subject to Overhead						Exempt from Overhead		Total Cost
			Salary	Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead (19%)	Equipment	Graduate Student Fee Remission	
2001	Task 1	298	$6,297	$1,111	$1,847			$1,412			$10,667
	Subtask 1.1	40	$857	$151	$0			$192			$1,200
	Subtask 1.2	256	$5,440	$960	$1,847			$1,220			$9,467
	Task 2	0									$0
	Subtask 2.1	0									$0
	Subtask 2.2	0									$0
	Subtask 2.3	0									$0
	Subtask 2.4	0									$0
	Project Management	8	$238	$42	$0	$0	$0	$53			$333
Total Cost 2001			$6,535	$1,153	$1,847	$0	$0	$1,465	$0	$0	$11,000
2002	Task 1	0									$0
	Subtask 1.1	0									$0
	Subtask 1.2	0									$0
	Task 2	1864	$20,910	$3,690	$5,542			$4,678			$34,820
	Subtask 2.1	24	$510	$90				$114			$714
	Subtask 2.2	864	$8,160	$1,440	$3,695			$1,824			$15,119
	Subtask 2.3	720	$6,800	$1,200				$1,520			$9,520
	Subtask 2.4	256	$5,440	$960	$1,847			$1,220			$9,467
	Project Management	24	$714	$126				$160			$1,000
Total Cost 2002			$21,624	$3,816	$5,542	$0	$0	$4,838	$0	$0	$35,820
Total Project Cost			$28,159	$4,969	$7,389	$0	$0	$6,303	$0	$0	$46,820

G. Local Involvement

Since this proposal is part of a larger project (the Robinson Restoration project), the plan for public outreach to the groups and individuals who may be affected by the project will be the plan in the Robinson Restoration project CALFED proposal.

H. Compliance with Standard Terms and Conditions

The U.S. Fish and Wildlife Service will comply with the state and federal standard terms.

I. Literature Cited

Bovee, K. D. (editor) 1996. A comprehensive overview of the Instream Flow Incremental Methodology. U. S. Geological Survey, Fort Collins, CO.

Gallagher, S. P. 1999. Use of two-dimensional hydrodynamic modeling to evaluate channel rehabilitation in the Trinity River, California, U.S.A. U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata, CA. 36 pp.

Sauls, E. 1999. Monitoring of Restoration Project in Clear Creek, Annual Progress Report, Fiscal Year 1999. U. S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, CA. 4 pp.

Steffler, P. and J. Sandelin. 1998. R2D_Habitat Version 1.3©. University of Alberta, Fisheries and Oceans Canada and U.S. Geological Survey. Program Copyright 1998. fttp://maligne.civil.ualberta.ca/pub/habitat/CDG2D.

Steffler, P. 1999. River2D Version 0.82©. University of Alberta, Fisheries and Oceans Canada and U.S. Geological Survey. Program Copyright 1999. fttp://maligne.civil.ualberta.ca/pub/habitat/CDG2D.

J. Threshold Requirements

The Letters of Notification, Environmental Compliance Checklist, Land Use Checklist and contract forms are attached to the back of this proposal.

Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.*

1. **Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?**

   _____ **YES** X **NO**

2. **If you answered yes to # 1, identify the lead governmental agency for CEQA/NEPA compliance.**

   _____
   Lead Agency

3. **If you answered no to # 1, explain why CEQA/NEPA compliance is not required for the actions in the proposal.**

   only monitoring

4. **If CEQA/NEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.**

5. **Will the applicant require a ccess across public or private property that the applicant does not own to accomplish the activities in the proposal?**

   X **YES** _____ **NO**

   If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide a ccess needs and permission for access with 30 days of notification of approval.

6. Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

LOCAL		
Conditional use permit	___	
Variance	___	
Subdivision Map Act approval	___	
Grading permit	___	
General plan amendment	___	
Specific plan approval	___	
Rezone		___
Williamson Act Contract cancellation	___	
Other _____ (please specify)		
None required	X	
STATE		
CESA Compliance	___	**(CDFG)**
Streambed alteration permit	___	**(CDFG)**
CWA § 401 certification	___	**(RWQCB)**
Coastal development permit	___	**(Coastal Commission/BCDC)**
Reclamation Board approval	___	
Notification	___	**(DPC, BCDC)**
Other _____ (please specify)		
None required	X	
FEDERAL		
ESA Consultation	___	**(USFWS)**
Rivers & Harbors Act permit	___	**(ACOE)**
CWA § 404 permit	___	**(ACOE)**
Other _____ (please specify)		
None required	X	

DPC = Delta Protection Commission
CWA = Clean Water Act
CESA = California Endangered Species Act
USFWS = U.S. Fish and Wildlife Service
ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act
CDFG = California Department of Fish and Game
RWQCB = Regional Water Quality Control Board
BCDC= Bay Conservation and Development Comm.

Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.*

1. **Do the actions in the proposal involve physical changes to the land(i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?**

   _____ YES X NO

2. **If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).**

   monitoring only

3. **If YES to # 1, what is the proposed land use change or restriction under the proposal?**

4. **If YES to # 1, is the land currently under a Williamson Act contract?**

   _____ YES _____ NO

5. **If YES to # 1, answer the following:**

   Current land use _____
   Current zoning _____
   Current general plan designation _____

6. **If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?**

   _____ YES _____ NO _____ DON'T KNOW

7. **If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal?**
   _____

8. **If YES to # 1, is the property currently being commercially farmed or grazed?**

   _____ YES _____ NO

9. **If YES to #8, what are** **the number of employees/acre**_____
   the total number of employees _____

10. Will the applicant acquire any int erest in land under the proposal (fee title or a conservation easement)?

_____ YES X NO

11. What entity/organization will hold the int erest?_____

12. If YES to # 10, answer the following:

Total number of acres to be acquired under proposal _____
Number of acres to be acquired in fee _____
Number of acres to be subject to conservation easement _____

13. For all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:

manage the property _____

provide operations and maintenance services _____

conduct monitoring _____

14. For land acquisitions (fee title or easements), will existing water rights also be acquired?

_____ YES _____ NO

15. Does the applicant propose any modifications to the water right or change in the delivery of the water?

_____ YES X NO

16. If YES to # 15, describe_____

Agreement No.:_____

Exhibit:_____

ADDITIONAL STANDARD CLAUSES

Recycled Materials. Contractor hereby certifies under penalty of perjury that 0 (enter value or "0") percent of the materials, goods and supplies offered or products used in the performance of this Agreement meet or exceed the minimum percentage of recycled material as defined in Sections 12161 and 12200 of the Public Contract Code.

Severability. If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

Governing Law. This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

Y2K Language. The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant." For purposes of this Agreement, a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

Child Support Compliance Act. For any agreement in excess of $100,000, the Contractor acknowledges in accordance therewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable State and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code; and

2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

STANDARD CLAUSES - CONTRACTS WITH THE UNITED STATES

Workers' Compensation Clause. Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this contract. This provision shall apply to the extent provided by federal laws, rules and regulations.

Claims Dispute Clause. Any claim that Contractor may have regarding the performance of this agreement including, but not limited to, claims for additional compensation or extension of time, shall be submitted to the Director, Department of Water Resources, within thirty days of its accrual. State and Contractor shall then attempt to negotiate a resolution of such claim and process an amendment to this agreement to implement the terms of any such resolution. However, Contractor does not waive any rights or duties it may have as may be provided by federal laws, rules and regulations.

Nondiscrimination Clause. During the performance of this contract, the recipient, contractor and its subcontractors shall not deny the contract's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age (over 40), or sex. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), the regulations promulgated thereunder (California Administrative Code, Title 2, Sections 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Government Code Sections 11135 - 11139.5), and the regulations or standards adopted by the awarding State agency to implement such article. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding Sate agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause. Recipient, Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

Availability of Funds. Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

Audit Clause. For contracts in excess of $10,000, unless otherwise provided by federal laws, rules or regulations, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

Payment Retention Clause. Ten percent of any progress payments that may be provided for under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

Reimbursement Clause. If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: Sacramento.

Americans With Disabilities Act. By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

Conflict of Interest. Current State Employees: a) No State officer or employee shall engage in any employment, activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any State agency, unless the employment, activity or enterprise is required as a condition of regular State employment. b) No State officer or employee shall contract on his or her own behalf as an independent contractor with any State agency to provide goods or services.

Former State Employees: a) For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.